Rudder Flutter

Idaho Transportation Department, Division of Aeronautics

To foster, develop, and maintain Idaho's aviation programs, facilities, and services

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ADVENTURES WITH A HOT MAG

By John Francis Borra

The skydivers were eager to be airborne; it was getting late and we had to climb ten thousand feet for a tandem jump. The jumpmaster pulled the door closed as I jabbed the mixture, prop, throttle, and carb heat, pulled the master and punched the starter. The engine fired and I throttled our craft across the grass.

Having checked the mags and prop prior to the day's first jump, I pulled down a notch of flaps, unscrewed the mixture an inch, and firewalled the throttle. Halfway down the runway I sensed a lack of enthusiasm in the ship; I eased the yoke back, trying to coax her off. It then struck me – the engine was not its usual boastful self.

"Stop!" It was the jumpmaster, calling from the back cabin. Now I *knew* something was wrong. I pulled hard on the throttle, stepped on the brakes and pulled off my David Clark's. Seated on the floor and facing forward, he had a clean view of the panel. "Your mags are off." I stared, confused, at the ignition key. "We've got a hot mag," he explained.

In my haste to take off, I had forgotten to turn on the mags. But when I pressed the starter, an ungrounded magneto – the "hot" mag – had fired the engine. Taxiing into position, unaware that we were operating on a single mag, all seemed in order for takeoff. Although she was about to unstick when we aborted, I am not certain we could have flown out of ground effect. A heavy load, warm weather and incomplete combustion would have made for a lousy trip.

I should have known better. The aircraft had warned me – *four times.*

The first was during the mag check that morning. The RPM did not drop when the ignition was switched from "both" to "right." I passed it off as a good mag. What I didn't recognize was the sign of an ungrounded magneto. When I selected "right" the left magneto should have dropped off-line, registering the usual loss of power. But because the left magneto was not grounded – due, most likely, to a wiring problem – it remained on. What I mistook for a good right magneto was actually an ungrounded left magneto.

The second time was during the preflight check. The mag switch was in the "off" position, where I had left it when shutting down earlier in the day; in my haste I had overlooked it, thus setting myself up to launch on a single set of spark plugs.

The third was at engine start. A conscientiously maintained and carefully operated ship, this bird had a pleasant habit of starting instantly. This time it hesitated before catching – something I chalked up to the vagaries of battery power.

The fourth time was during takeoff. The sound and feel of the aircraft were out of the ordinary; had I glanced at the manifold pressure gauge at the beginning of the roll, I might have caught the problem immediately. As it happened, the takeoff was not aborted until a passenger raised an objection. Not the proudest moment in my flying career.

It had all the ingredients of a classic aviation accident: one part mechanical glitch, two parts human error. The ungrounded magneto alone was hardly a danger. It was compounded, however, by two of the greatest vices a pilot can have: haste and complacency.

I learned about flying from that. These days, I add fuel, perform the walk-around and get seated with plenty of time. I check the seat position, connect my headset, and strap in. I follow a simple, straightforward pattern, setting engine controls and instruments well in advance of takeoff, avoiding haste and its usual consequence – oversight.

And I listen more closely to the engine. After all, if it's running, it's talking – and if it's talking, it's likely to tell me if it has a problem.

ADMINISTRATOR'S COLUMN

All About Charts

By BART WELSH, Aeronautics Administrator

State Aeronautics is in the process of finalizing the new state chart, which should be out in the next few months. This will be an upgrade of the one we have had in the past, which has been very popular. It will have many new airports listed, especially the backcountry, which will be a great safety addition.

Producing this chart has brought up a lot of new discussion and some old questions. The most commonly asked question is if we are required to have a current chart in our aircraft. You can go into almost any aviation group and ask this question and be assured of getting a good discussion. I have done some research on this, including checking with the FAA, to try to get a definitive answer to this question. The bottom line is that you are not required to carry a current chart on a flight if you are operating under Part 91.

As you know, Part 91 requires pilots to familiarize themselves with all pertinent information for the flight intended. Clearly, to familiarize yourself with an intended flight, looking at a chart would be one of those items. It is, however, possible that you might look at the chart, memorize all of the pertinent information and therefore be qualified under the FAA legal requirements. If you are flying over a route with which you are very familiar, the need for chart is probably quite different than going on an extended cross-country to an area you have never been before.

Moving away from the legal thing to common sense, what is the best way to handle this? Things change in charts. We laugh about the fact that mountains don't move and roads stay in the same place, but as we do the state chart and the Facilities Directory, we have discovered there are constant errors that need to be corrected. Some are minor, such as frequencies that are wrong for UNICOM or towers, but also things that are substantially wrong, such as heights of mountains, and lengths of runways, that need to be corrected. So it makes sense to have a current chart. I have found that by carrying a current WAC chart I have at least one place with all the pertinent and current information.

When the new state chart comes out, it will automatically be sent to all registered Idaho Airmen. Anyone who is not a registered airman in Idaho can contact our office for the new chart and facilities directory.

TWIN FALLS AIRPORT OPEN HOUSE/FLY-IN UPDATE

Plans for AIR MAGIC VALLEY, a combination open house/fly-in scheduled for July 25th at the Joslin Field, Magic Valley Regional Airport, are almost complete. Formerly known as Airport Appreciation Day, the new name gives the event its own unique quality and reflects our commitment to develop a program that will make the name AIR MAGIC VALLEY synonymous with excellence. The planning committee estimates attendance to exceed 10,000 spectators.

Over 50 aircraft have committed to be displayed, with another 30 still in negotiations. Among the displays will be vintage and new general aviation and commercial aircraft, military fighters and helicopters, warbirds, and new kit aircraft, including ultra-lights. Several aircraft will perform aerial demonstrations and fly-bys, including a YAK-11, Yak-18s, a T-33, T-6s, T-28s, and Skystar's Pulsar. Other displays include the Idaho Military Historical Museum, the Idaho Aviation Association, Aviation Art by William Gardaski, the Civil Air Patrol, and vintage car clubs. American Flying Aces will also be on hand to sign autographs and swap stories.

Aircraft arrivals for both participants and fly-in spectators are between 7:00 and 9:45. Friday arrivals are welcome, of course. The airport is sponsoring breakfast for all participants and fly-in spectators. Gates open from 10:00 to 4:00. Cactus Pete's Resort Casino is offering special rates for those who wish to stay overnight in the area.

For additional information or to coordinate entering an aircraft into the event, please contact David Allen at 208-733-5215, extension 6.

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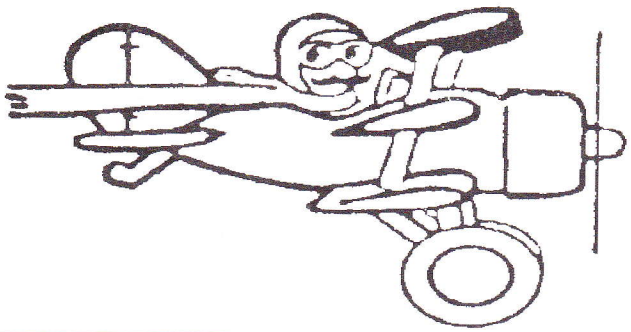


Airport News

Work Party

The Idaho 99's held their annual work party at Smith's Prairie on June 13. Attending were ten members of the group accompanied by Bart & Olivia Welsh and Mark Young from Aeronautics. The fence was repaired, holes filled and rodents eradicated. The Division would like to thank all of those who helped make this effort a success.

Other groups currently working at state airports include the Civil Air Patrol, Idaho Aviation Association, Snake River Brush Pilots and the EAA. We would like to thank all of those involved in helping to make our program of state airports a successful one.

Courtesy Cars

The Division recently added another courtesy car to its fleet, with the new one being assigned to American Falls. Airports now served by these vehicles include Arco, Bear Lake (Montpelier), Bonners Ferry, Gooding, Grangeville, Jerome, Kamiah, Malad, Mountain Home, Orofino, Preston, Rexburg, and Sandpoint. The car at Weiser was eliminated.

In addition to those mentioned above, state airports having seasonal access to cars include Cavanaugh Bay, Johnson Creek and Smiley Creek. These are normally available from the weekend prior to Memorial Day to the weekend following Labor Day.

We would expressly like to thank those FBO's and airport managers who give their time in making these vehicles available to the flying public. Many of them spend a great many hours each month renting the vehicles, servicing them and filing reports while not receiving monetary consideration from the Division for their efforts.

NOTAMS

This spring has been extremely wet, leaving many of our airports soggy and/or muddy. NOTAMS have been issued at various times on Cavanaugh Bay, Twin Bridges, Johnson Creek, Big Creek and Magic Reservoir. Please remember to check with Flight Services prior to departing for the backcountry. Your diligence in doing so will help us maintain the best possible surface for your future arrivals.

Recognition

On occasion we receive letters from individuals who are appreciative of the assistance they receive from full time as well as seasonal employees. We would like to recognize those people who take the time to express their gratitude for the efforts of our staff. A heart felt thanks to those who have written us with their thoughts and kindness.

AIRSTRIP STATUS REPORT

As of June 30th, work has begun on the Cabin Creek airstrip. The contractor is using a temporary landing strip that is **NOT open for public use.** It is too early to project a completion date but allowing for work completion and for vegetation to take hold puts the use date at sometime in 1999. For more information please call Clem Pope at 208/634-0600.

Cold Meadows remains **CLOSED** until further notice.

Chamberlain is open as of June 20th. Please **DO NOT taxi between the strips**.

Density Altitude: the Silent Killer

Each year the high altitude airports of Idaho take a toll on pilots who do not compute density altitude prior to attempting a takeoff.

What is density altitude anyway? It is something that is taught from the beginning in flight training, so why does it become a factor in so many accidents each year? **Density altitude is the altitude the aircraft thinks it's at, not the airport elevation.** This sounds so simple, but is often overlooked because it is just that simple. Although density altitude is often computed, seldom is it given proper consideration during takeoff, resulting in an accident.

As instructors and safety lecturers, we show pilots how to use their flight computers and other equipment to compute this magic density altitude and sometimes don't fully explain to them how to use the information after they compute it. Density altitude effects the performance of the whole aircraft. True airspeed is increased, propeller thrust is decreased, lift from the wing is decreased, and engine horsepower is decreased. With all these negatives, how do we retain the safety margin required to fly successfully from high altitude airports? After computing the density altitude of the airport, there is a simple formula that will give the pilot an idea of how much weight must be removed from his aircraft to regain near sea level performance. This solution does not take into account TAS, but this will have little overall effect.

The formula for computing a new gross weight is:

Gross Weight Divided By Horsepower = Power To Weight Ratio

Horsepower Divided By 30 Inches = Horsepower Per Inch Manifold Pressure

30 Inches Minus 1 Inch Per 1000 Feet Of Density Altitude = Inches Of Manifold Pressure Available

Inches Of Manifold Pressure Times Horsepower Per Inch = Actual Horsepower

Actual Horsepower Times Power To Weight Ratio = New Gross Weight

An example of this is:

300hp C185 at 8000 feet density altitude

3300 pound gross weight B 300 horsepower = 11 (power to weight ratio)

300 horsepower B 30 inches (power available at sea level) = 10 horsepower per inch

8000 foot density altitude

30 inches – 8 inches (1 inch per 1000 feet of altitude) = 22 inches manifold pressure available

22 inches x 10 horsepower per inch = 220 horsepower available

220 horsepower x 11 (power to weight ratio) = **2420 pounds New Gross Weight**

It can been seen that the 300 hp C185 has now turned into a weak C182 and to return to sea level performance the 3300 pound gwt must be reduced by nearly 900 pounds. This rule of thumb will work for any normally aspirated engine and aircraft. The turbocharged aircraft do not have the same loss of horsepower unless they are above the critical altitude for the turbo system. Turbocharged aircraft still have to consider density altitude for runway length because of higher TAS required to fly at high altitude and less than full thrust from the prop.

In summary, with careful consideration of the elements, flying can remain a safe and enjoyable way to see our state.

1998 CALENDAR OF EVENTS

JULY

8-11 McCall Mountain/Canyon Flying Seminars
Lori MacNichol/Amy Hoover 208/634-1344

10-19 Glider Group, Smiley Creek

10-12 Flying Farmers – Lewiston
Exploring the Lewis and Clark Trail
Belinda Zephir 208/746-7962

15-18 McCall Mountain/Canyon Flying Seminars
Lori MacNichol/Amy Hoover 208/634-1344

18 Rexburg Fly-in Airshow – Rexburg
Teton West 208/356-7926

17-19 Family Fly-in – Kalispell, MT
Jim Cooney Helena FSDO 1-800/457-9917
John Goostrey Boise FSDO 208/334-1238

19-23 Oregon Air Tour 541/746-3887

22-25 McCall Mountain/Canyon Flying Seminars
Lori MacNichol/Amy Hoover 208/634-1344

25 Airport Appreciation Day
Joslin Field, Magic Valley Regional Airport
David Allen 208/733-5215 ext. 6

29-8/4 Oshkosh '98

31-8/2 International 180-185 Club Fly-in
Johnson Creek
Al Hewitt 206/941-3052

AUGUST

3-5 ACE Academy – Boise
Frank Lester 208/334-8775

8-9 IAA Fly-in – Johnson Creek

24-27 B-17 Sentimental Journey & German He-111 Bombers CAF Flying Museum, Boise
Website: http://www.airbase1.com/azcaf

24-28 28-30 B-17 Sentimental Journey & German He-111 Bombers CAF Flying Museum, Pocatello
Website: http://www.airbase1.com/azcaf

SEPTEMBER

12-16 67th NASAO Meeting – Grand Rapids, MI
301/588-0587

OCTOBER

16-17 Division of Aeronautics Flight Instructor Refresher Clinic – Shilo Inn, Idaho Falls
Frank Lester 208/334-8775

19-21 NBAA Annual Meeting & Convention
Las Vegas, NV
202/783-9362

1999

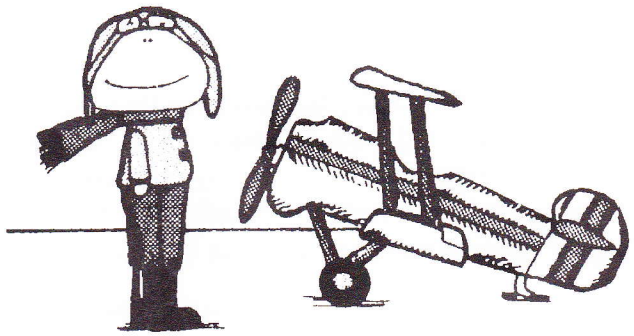
FEBRUARY

19-20 Division of Aeronautics Flight Instructor Refresher Clinic – Holiday Inn, Boise
Frank Lester 208/334-8775

MARCH

25-27 7th Annual Idaho State Aviation Conference
Vista Holiday Inn, Boise
Frank Lester 208/334-8775

To get your upcoming event published in the *Rudder Flutter,* send information to Division of Aeronautics, P.O. Box 7129, Boise, ID 83707-1129. Be sure to include contact person and pertinent information. E-mail dedaniel@itd.state.id.us or e-mail flester@itd.state.id.us



TAKE TO THE SKIES

FYI...

October Flight Instructor Refresher Clinic

That's right, as planned, we are adding a second FIRC with a slight twist to the schedule of events. This year we will begin in the afternoon (around 3PM) on Friday, October 16th and run the clinic through 5PM on Saturday the 17th. We thought this would be an improvement over previous clinics by not tying up your entire weekend. We will hold the clinic at the Shilo Inn in Idaho Falls. Another change we are making will be a dinner on Friday night, catered through the hotel, which will be included in the cost of the clinic. If we have enough of an attendance we may be able to include a lunch on Saturday as well. We hope to make the clinic as "painless" as possible as well as enjoyable and educational. Attendance will be limited to 40 attendees.

We will still have our Boise FIRC in February. If the format we use in Idaho Falls is successful we will make the same changes to that clinic.

Let us know your thoughts and comments. For more information, call 1-800-468-5865, 1-208-334-8775, or fax us at 1-208-334-8789. Read the information and application inserts in this issue of the Rudder Flutter carefully as there are some administrative changes that have been made as well.

7th Annual Idaho State Aviation Conference

The 7th Annual Idaho State Aviation Conference, scheduled to be held March 11-13th, 1999 has been re-scheduled to March 25-27th at the Airport Holiday Inn on Vista Ave. The change was due to the limited conference facilities available in Boise. A year in advance of the conference would seem to be adequate time to lock in the desired dates but unfortunately that is not the case. It seems 18-24 months is necessary to set your schedule. At any rate, I hope the change won't adversely impact your schedule. There are still 264 days until the conference opens and this year will be better than last year's – **GUARANTEED!** Watch the Rudder Flutter for more information and **SEE YOU AT THE CONFERENCE!**

Speaking Volunteers Needed

The Division of Aeronautics is always looking for volunteers to speak at schools and civic organizations throughout the state. We are putting together a list of volunteers to help us respond quickly to these requests. We have a number of volunteers who have worked with us in the past and we wish to thank them for their help in putting on these presentations. However, this list has been not been updated for some time and with the addition of several new personnel to our staff, some of these very important people may have inadvertently been overlooked. Therefore, if you are interested in continuing to help us spread the word of aviation or would like to start, take a moment and either fax or mail the information below or call it in to one of our office staff.

Name: _____

Address: _____

Business Phone: _____ Fax: _____

Occupation: _____

(800) 468-5865 (208) 334-8775 FAX (208) 334-8789

FYI.....

ACE Academy Needs Host Families!

We need volunteer host families to house students for this year's ACE Academy. The three-day event runs from August 3rd through August 5th, at the Division of Aeronautics. This year we will have 40 students attending the academy. Although we don't have a count of those who will need to be housed, in the past the number has run less than ten students. The number needing housing this year should remain about the same.

If you live in the Boise area and are interested in hosting an ACE Academy student for 4-5 nights please give us a call at 334-8775 and put your name on our list. As the requests for housing come in we will call on a first in, first out basis and put you in touch with the student's family to complete arrangements and get an opportunity to speak with them first hand.

We need your help. Please volunteer today and help ensure that each applicant has the chance to attend this excellent educational event.

RUDDER FLUTTER NEEDS INPUT

The *Rudder Flutter* is YOUR newsletter. Help the Aeronautics staff spread the Idaho aviation word by sending us articles, photos, and anything else you would like to see published. We welcome all input from our readers!

Jay Morris is looking for one, possibly two, members of the National Ag Assn. willing to volunteer to assist with the booth at Oshkosh. Please call Jay at 365-6968 for more information.

WE GOT HELP!!!

Please join us in welcoming Lisa Marschall, our receptionist who joined us June 15th. She is a welcome addition to our front office.

We also welcome Tim Henderson, aircraft technician. Many of you may know Tim from the field at BOI. Tim joined us June 29th and is replacing Bill Weiss, who is retiring July 31st.

After 18 years with the Division, Bill has decided to retire. We will miss him and wish him the best of luck.

FY 1999 AIRPORT GRANTS

The Idaho Transportation Board, upon the recommendation of the Aeronautics Advisory Board, approved state grants to 16 municipal airports for FY 1999 (beginning July 1, 1998) totaling $500,000. Projects marked with an asterisk provide match for FAA funded projects; on all others costs will be shared by the Division and the local airport authority.

AIRPORT	DESCRIPTION	AMOUNT
Boise	Airport development projects	$75,000
Caldwell*	Relocate road, canal, and drain; construct taxiways and fence	24,406
Challis*	Rehabilitate runway, taxiways, and apron	7,222
Coeur d'Alene*	Extend taxiways and construct apron	11,062
Council *	Rehabilitate pavements, widen runway, expand apron, replace runway lights	21,917
Craigmont	Overlay runway	61,000
Driggs*	Extend parallel taxiway, sealcoat pavements, and install PAPI and REIL's	21,917
Emmett	Overlay taxiway	76,875
Hailey	Airport development projects	20,000
Idaho Falls	Airport development projects	25,000
Lewiston	Airport development projects	20,000
McCall	Crack seal runway	10,500
Moscow-Pullman	Airport development projects	20,000
Pocatello	Airport development projects	20,000
Rockford	Overlay runway	31,600
Twin Falls	Airport development projects	20,000
Various	Inventory restock/small projects	7,257
	TOTAL	$500,000

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